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RESEARCH ARTICLE

VALUE CHAIN ANALYSIS OF KIDNEY BEANS (*Phaseolus vulgaris* L.) IN THE API-REGION OF DARCHULA DISTRICT, NEPAL

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ARTICLE DETAILS	ABSTRACT
	The research was conducted to study on value chain analysis of kidney beans in the Api-Himal region of the Darchula district to gain information from kidney beans producers and traders. Semi-structured questionnaires were used to collect the primary data from 50 households, and 15 from traders by using the purposive sampling technique. Out of 641 ropani, 255 ropani were used for Beans production. 255 ropani of land needed 1,020 kg of seeds, and productivity was 1.29 mt. /ha. It was found that 72.92% of the members were engaged in agriculture. The study showed that 1 kg of seed cost 120 Rs. The average yield was 202 kg. The average farm-gate price was Rs 141 per kg, and the market was Rs 160 per kg. The mean b/c ratio was 1.3. The land use and productivity of beans is in an increasing trend in recent years. Various problems in the production and trading system gave low returns. There was a large gap between farm gate price, and market price because of many middleman channels and higher transportation costs.

1. INTRODUCTION

Kidney beans (*Phaseolus vulgaris* L.) are a native crop of Central and South America, commonly known as French beans or Simi in Nepali (Shrestha et al., 2022). French beans were first cultivated some 7000 years ago by Indian cultures in Peru and Mexico. French beans are widespread in Nepal, including pole and bush varieties. Pole beans, on the other hand, are Nepal's most significant and widely grown green vegetable. It is typically grown at altitudes ranging from 300 to 2,500 meters during various seasons (Neupane et al., 2007). It's extensively grown in temperate, subtropical, and tropical climates, and it's one of the most significant legumes for human diet in the world (Singh, 1999).It is a common vegetable in Nepal and much of Asia's hot and humid regions, while native beans are also popular (Odero et al., 2013). For improved growth and productivity of French beans, the ideal average temperature is 20-25o C. Extremely hot temperatures disrupt pod filling, whereas cold conditions inhibit vegetative growth (Pandey et al., 2012).

French beans, both bushy and climber (pole) types, are produced in the hills (500 – 1600 masl) from summer to autumn for consumption as young green pods. Beans, together with maize, are planted in high hills and mountains (1600-2500 masl) from summer to winter, as well as in apple orchards (Pandey et al., 2012). When compared to beans grown in Nepal's Terai region, high-hill beans have a greater taste and are regarded more healthy. Maize is now regularly produced alongside kidney beans since it yields a strong return and has a well-established market (Neupane et al., 2007; Shrestha et al., 2022).

Pole-type French beans have a total area of 2,487 ha, a production of 24,647 mt, and a productivity of 9.91 mt/ha in Nepal (MOALD, 2020a). In the meantime, the Darchula district's total area, production, and productivity of pole-type French beans are 20 ha, 313 mt, and 15.58 mt/ha (MOALD, 2020b). Despite the fact that the average national production of French beans is quite low, the Darchula district's output is substantially

greater. Bean production may be low due to a lack of high-yielding improved cultivars and a combination of cultivation approaches the volume of production is significant, yet it is not accurately recorded in the government database. The market pricing, trade, and distribution routes for kidney beans are uncertain, and commercial trading occurs without formal records or marketing channels. 2008 (Banjade & Paudel, 2008).

The whole life cycle of a commodity, product, or process is referred to as a value chain, which includes material source, production, harvesting, marketing, consumption, and disposal/recycling. "A value chain is a set of actions that takes a product, commodity, or service from conception to final disposal after use, including multiple stages of manufacturing, transformation, and delivery to the end customer" (Al-Mudimigh et al., 2004; Lamming, 1996). The value chain, according to, is a vertical alliance or strategic network inside a supply chain that connects numerous independent commercial entities (Hobbs & Young, 2000). As a result, rather than focusing on value generation, the emphasis is placed on the permanence of linkage among chain actors. The value chain can be considered as a horizontal relationship relating to one of the components at a specific level of the chain, such as in retailing, or as a vertical relationship referring to those connecting players at different stages of the chain, such as producers, wholesalers, and retailers. As a result, the research of the value chain of kidney beans provides insight into the various actors, their roles in the creation of kidney bean value, and how profits are shared among them.

The current study examines the Kidney bean supply chain and market scenario in the upper Darchula region of Far Western Province, where bean production and export are higher and contribute to national income. This study also examines gaps and suggests solutions. In Nepal, there isn't a lot of research done on common beans.

People that live in hilly areas rely heavily on pulses. Kidney beans are one of the most important pulses farmed by the people. Different beans have

been highlighted by the Nepalese government as important pulses, with kidney beans being one of them. The kidney bean trade receives very little attention. The demand for beans is growing every day, and the number of people interested in the trade is expanding too, increasing the price of the beans. However, the share of benefit gained by the producer is not as much as the price. As a result, the price of the beans is a major factor in balancing demand and supply. The people's economy is mainly dependent on the yield of kidney beans and the price they earn. Market agents are making a lot of money, while producers aren't getting anything out of the harvest. The government and other stakeholders continue to overlook kidney bean value chain research and extension.

Kidney beans are one of the most important sources of protein for people in the Himalayan region. The Api-Himal RM's villages have few options for sustaining themselves and generating cash. The climate is ideal for growing kidney beans, and their trade has a direct impact on rural communities' livelihoods. In response to rising demand and the number of consumers, bean cropped area, production, and productivity are all increasing.

The Api-Himal Rural Municipality is ideal for kidney bean farming. As a result, it is obvious that trading takes place here as well. Cultivators, on the other hand, do not receive a premium for their produce. The price that cultivators receive vs the price that customers pay is vastly different. This study focuses on the marketing of kidney beans from the growers to the final consumers, and also the middlemen involved.

Pulses are a key component of the livelihood of people residing in the Himalayan region. The land of the Api region is suitable for the cultivation of kidney beans. Very few studies have been conducted regarding the value chain analysis of kidney beans and the research supporting this topic is also few. The value chains for common beans are relatively short, and they do not yet take advantage of regional/international potential. Market concentration metrics revealed that markets were oligopolistic and inefficient in structure (with a substantial price difference amongst final consumers) (Kessy et al., 2020; Orr et al., 2018). The gross benefit of the customers' pricing was largely for town wholesalers (38.60 percent) and least for agricultural traders (13.22 percent). Processors made the highest money (11.52 percent) while rural farmers made the least money (7.36%). The statistics found that women made up a larger percentage of the traders, with the bulk of them being retailers (Tesfaw, 2015). The women traders also had an average of longer years in the retail sector than the males, and the biggest obstacles to bean commerce were high transportation costs, excessive rains, and supply inconsistencies. French beans are excellent in nutritional value, giving calcium, vitamin C, vitamin A, and vitamin B, among other nutrients (Odero et al., 2013; Kelly et al., 1992). According to statistics, around 70% of the money is spent on agricultural items, which have a better chance of being produced within the country even after local consumption. (Paudel, 2016). Bean varieties abound in Nepal's slopes and hills, and some indigenous beans have a particular flavor (Aryal et al., 2020; Joshi et al., 2020). Among the chain shareholders, farmers had the smallest share of value-added agricultural items. Farmers benefited more from shorter chains than from longer chains with brokers(Odero et al., 2013). The linkages between the various channels of the bean value chain are weak. Due to services such as pre-financing, there are significant linkages between seed businesses and seed multipliers (producers), as well as between village collectors and producers. Despite tighter regulations, exports increased dramatically, and the shift from smallholder contract farming to integrated estate production changed the mechanism by which impoverished households gain (Rusike et al., 2019; Maertens & Swinnen, 2015, 2009; Swinnen, 2014; Swinnen et al., 2013).

Until now, relatively little research has been done on the trade, particularly the bean value chain. The middle man has no defined position, but they are entitled to a piece of the profit. Cultivated crops do not pose a barrier in terms of marketing and selling; rather, the true issue is to reward it with a reasonable price from field to plate. The main issues to be addressed are how the beans get from the cultivator to the consumer. Low levels of knowledge about the current state of the market, as well as the price of beans, grading of the commodity, low bargaining power, monopoly, and monopolistic structures, are among the issues raised by cultivators and dealers.

We conducted this research to study the value chain analysis of kidney beans in the Api region of the Darchula district. Our study was also focused on the identification of the role and involvement of middlemen in the marketing chain of kidney beans and to prepare a clear map of the value chain of Kidney beans. Our study also identifies the problems faced by both the producers and the harvesters.

2. METHODOLOGY

In the present review, secondary data were exploited for the relevant information related to major weeds found in wheat, their effect on growth, and yield components with their management strategies. A thorough study of journal articles, research papers, related books, published reports was done to assess the impact of weeds in wheat crops and management strategies to combat the effect. The related articles have been downloaded from different sources like research gate, Google Scholar, Pubmed, Springer journals.

2.1 Site Selection

The study was carried out in the Darchula district of the Far-Western province of Nepal covering 2322 sq. km with an elevation ranging from 357masl to 7123masl. Api-Himal Rural municipality is one of the pocket areas for kidney beans production in the Darchula district. So, Api-Himal RM was purposively selected for the study because Kidney beans are grown here predominantly and the rural economy depends on beans production.

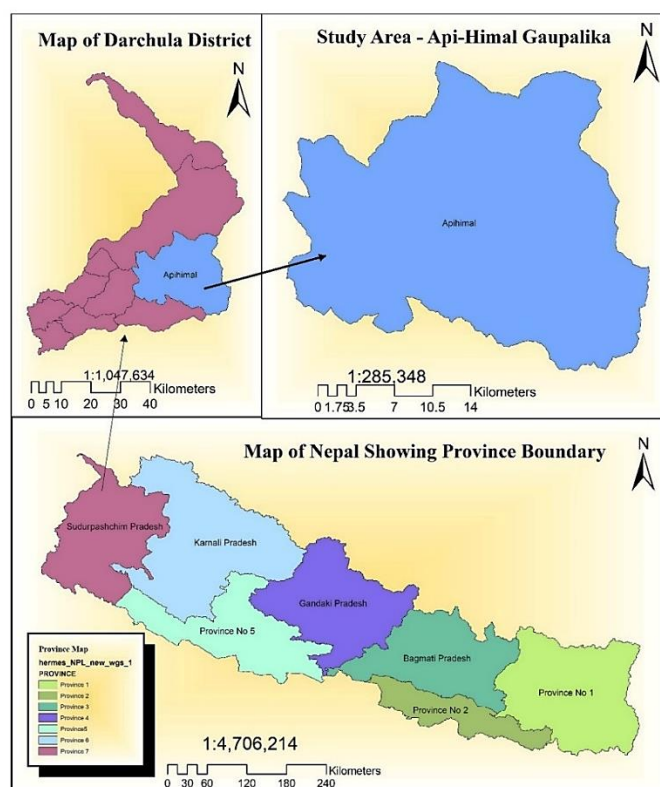**Study Area Map of Value Chain Analysis of Kidney Beans**

Figure 1: Study Area, Api-Himal Rural Municipality

2.2 Respondent Selection

Agriculture Knowledge Center, Darchula, is the main governing organization for kidney bean production and commercialization. Hundreds of households, as well as several marketing agencies, are involved in the bean production in the Darchula district. The sampling framework has been developed using information from key informants, secondary sources, information from AKC, and information from other stakeholders. People with a lot of experience in the production and marketing of kidney beans were chosen. Using multiple sources of information such as local residents, local officials, and other sources such as AKC and local farmers, the involvement of agents in the bean marketing was also identified.

2.3 Sampling Unit

On a simple random basis, a sample size of 50 HH with various socioeconomic status were selected from Api-Himal RM, and 15 traders involved in the gathering and trading of the beans were also chosen. The sample included persons of all ages, socioeconomic statuses, educational levels, ethnicity, gender, and other characteristics. The HHs and people with at least two years of experience in production to marketing were interviewed.

2.4 Nature, and sources of data

The study was concentrated on both the primary and secondary data which were gathered from two sources of data collection i.e. Primary source, and Secondary source. The study was mainly focused on the primary data collected., and, secondary data from which huge information was obtained to meet many set objectives.

2.4.1 Primary data

The primary data was collected through face-to-face interviews of HHs by administrating the semi-structured, structured, and unstructured questionnaire. After completing the HH survey, the involvement of the others in the production, and trading of the beans were also interviewed. The data obtained was verified, and validated by using focus group discussion, and key informants.

2.4.2 Secondary data

The secondary data was extracted from various publications, and reports prepared by different researchers, legal documents, organizations like AKC, Api-Himal Rural Municipality, etc.

2.5 Data collection methods

2.5.1 Interview

Primary data was collected through interviews with the HH head or member involved in the production of the beans to marketing. Information regarding the current environment of the trade of kidney beans viz; stakeholders, different agents, and other factors affecting the marketing, and the pricing of the kidney beans were collected through personal interviews with the inhabitants using pre-printed Paper-Pen questionnaires.

2.5.2 Focus Group Discussion (FGD)

The focus group discussion was carried out to validate and verify the data obtained. In FGD participants were the inhabitants, and other stakeholders representing the entire ethnic group, age category, economic status, education level, ethnicity, gender, and other parameters too.

2.5.3 Interview Schedule Design

The interview schedule was created in order to obtain primary data from the chosen respondents. With the research objectives in mind, the interview schedule was kept consistent. The interview schedule comprised both open-ended and closed-ended questionnaires. In the interview schedule, question sequencing was extremely important, and they were ordered in such a way that the preliminary question would create the information needed to complete the preliminary objective, and vice versa.

2.5.4 Field Survey

To acquire information from the selected respondents, a field survey was undertaken in the Api-Himal Rural Municipality of the Darchula area. Prior to the start of the main survey, a preliminary field survey was conducted using focus groups and interviews with HH and stakeholders. The field survey was conducted for ten days and included direct participation by researchers.

2.6 Methods, and Techniques of Data Analysis

Primary data from a field survey was coded and entered into a Microsoft Excel spreadsheet (version 2016). Secondary data was also kept. SPSS V.26 was used to evaluate the data that had been coded and kept. The data were analyzed using descriptive methods (mean, median, percentage, and so on). The results of the analysis were presented in the appropriate tables and figures, and the findings were interpreted using relevant literature.

2.6.1 Likert Scale Ranking Analysis

The five-point Likert scale ranking is used for different analyses of multiple-choice plus ranking questionnaires. An interval scale is used for ranking the activities from 1 to 5. The mean is very significant. From 1 to 1.8, it means strongly disagree. From 1.81 to 2.60, it means to disagree. From 2.61 to 3.40, it means neutral; from 3.41 to 4.20, it means agree; from 4.21 to 5, it means strongly agree.

3. RESULT AND DISCUSSION

3.1 Farmers' Socio-economic Characteristics

3.1.1 The age group of Farmers

Among all the respondents from Api-Himal rural municipality, the mean age was 41.06 years. The average age of respondents was found to be 44.2 years according to (Kumar, Anjani Roy, Devesh Tripathi, Gaurav Joshi, Pramod Kumar Adhikari, 2016)(Table 1).

Table 1: Age Group of Respondents			
	Minimum	Maximum	Mean
Age of Respondent	22	70	41.06

3.1.2 Gender of the Respondents

Participation of women (52%) was more than men (48%) in the household survey (figure 3). This finding may be taken as evidence of the priority of female members for household chores and men had been taking the responsibility of farming besides household decisions. About 80% of the agriculture farmers and labors are female (P. L. Bhandari & Kattel, 2020; Malla, 2021).
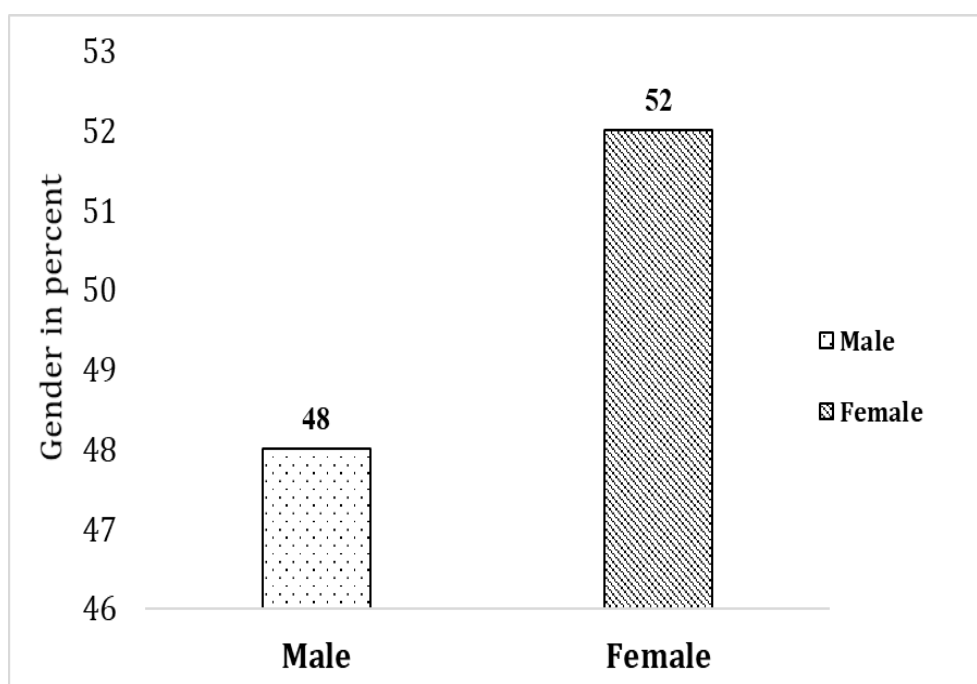

Figure 2: Gender Status of Respondents producing Kidney Beans

3.1.3 Ethnicity of the respondents

Gathered information revealed that in the rural municipality, 100% of the respondents belonged to the Chhetri community.

3.1.4 The religion of the respondents

This study showed that 100% of the respondents were found to be following the Hindu Religion.

3.1.5 Occupation of the respondents, and household members

From the survey, it was found that most of the respondents in each village were engaged in agriculture. The respondents have been growing various cereals and vegetables. It was found that 73% of the members were engaged in agriculture. Similarly, 17% in business, 8 in government jobs, and 2% in others. (Figure 4). The maximum percentage was involved in Agriculture followed by business and then services (Malla et al., 2021).
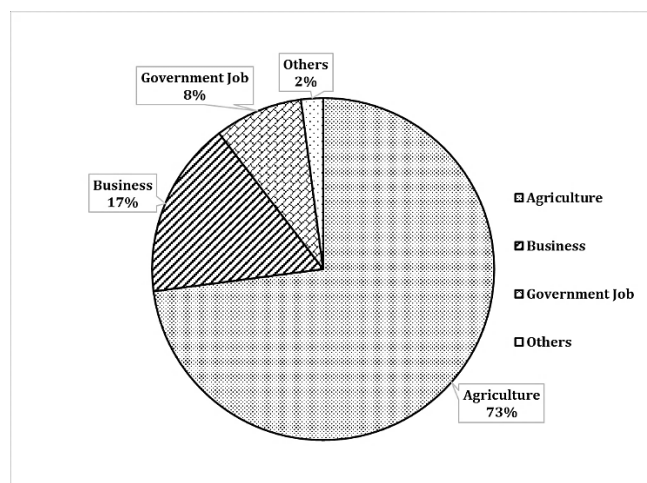

Figure 3: Primary Occupation of Respondents

3.1.6 The educational level of respondents

From the survey, it was found that most of the respondents in each village were illiterate (36%). 32% of respondents had studied below SEE. 18% of respondents had studied up to SEE. According to a researcher, the average no of years in education was found to be 9.5 years (Kumar et al., 2016). Similarly, 6% of the respondents had completed their College, and 8% of respondents had their education up to the university level. (Figure 5)
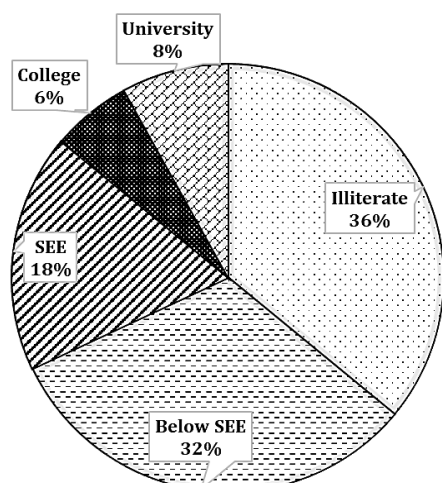

Figure 3: Educational Level of Respondents

3.1.7 Total Land Holding, and Land Allocated for Kidney Beans Cultivation

From the survey, it was found that the minimum area of land owned by a farmer was 2 ropani in which, 1 ropani was allocated for kidney beans. The maximum area of land owned was found to be 45 ropani in which, 16 ropani were allocated for Kidney beans. In general, out of 641 ropani of land owned by respondents, only 255 ropani were used for Kidney Beans production.

Table 2: Total Land Holding, and Land Allocated for Kidney Beans

Descriptions	Minimum	Maximum	Mean	Total
Land (ropani)	2	45	12.82	641
Land Area for Beans Cultivation (ropani)	1	16	5.10	255

3.1.8 Major inputs in Kidney Beans Cultivation

Seeds, FYM, and stakes were the major input in Kidney Beans cultivation. The respondents didn't use any chemical fertilizers or pesticides. For seeds, they used the same beans which they had grown the previous year and saved them to use the following year.

3.1.9 Procurement of Input Materials

The study showed that 60% of respondents procured seeds from locally available materials (seeds which they saved the previous year), and the remaining 40% procured seeds from both locally available materials and borrowing from their neighbors. None of the respondents bought their seeds from cooperatives, Agro-vets, seedbanks nor AKC.

Table 3: Procurement of Input Materials

Sources	Frequency	Percent
Locally available material	30	60
Both locally available materials, and neighbor	20	40
Total	50	100

3.1.10 Problems of Procurement

Table 4: Descriptive Statistics Showing attitude towards Problem of procurement

Statements	Minimum	Maximum	Mean
Seeds center too far	1	5	**3.84**
Low-quality inputs	2	5	3.74
Transportation	2	5	3.70
Low purchasing capacity	1	5	3.68
Inputs not available in time	1	5	3.40
Uncertified seeds	2	5	3.24

Note. 5 strongly agree, 4 agree, 3 un-decided, 2 disagree, 1 strongly disagree (The 5 Point Likert Scale Ranking)

In the first statement, the mean is 3.84 which means the majority of participants agreed that the seed-centers being too far, is the major problem of input procurement. Similarly, the other problems of input procurement are low-quality inputs, transportation, low purchasing capacity, inputs unavailability in time, and uncertified seeds respectively.

3.1.11 Land use for kidney beans production

Overall, in 5 years, the land-use trend for kidney beans was decreasing. It gradually increased at 2073 BS, then decreased at 2075 BS, and gradually increased from 2076 onwards.
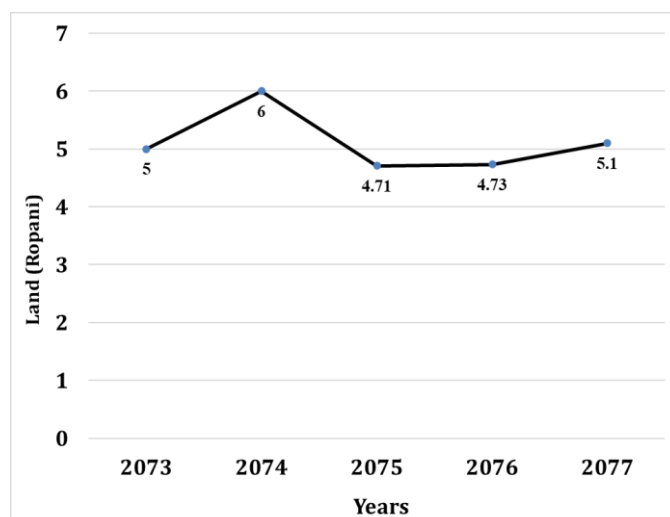

Figure 4: Land Use for Kidney Beans production

3.1.12 The total cost of production

The average cost incurred in production was Rs. 21,815. 68% of the cost was incurred in human labor and Rs. 6915 was incurred in organic manure. The average cost of Kidney beans production was 81355.8 Rs/ha (N. B. Bhandari et al., 2015).

Table 5: Total cost of Production

Items of cost	Mean (Rs. per ropani)	Percentage
Human labor	14,900	68
Organic manure	6,915	32
Total	**21,815**	**100**

3.1.13 Return from the production of the beans

The average quantity of beans produced was 202 kg, and the average price was Rs. 142/kg. The average return from the production was found to be Rs. 28,684. The average farmgate profit was found to be 64392.4 Rs/ ha and that of market was 66193.7 Rs/ha (N. B. Bhandari et al., 2015)

Table 6: Return from beans production

Income	Quantity *price	Total
Benefit	202 * 142	Rs. 28,684

3.1.14 Benefit-Cost Ratio

A benefit-cost ratio (BCR) is a ratio used in a cost-benefit analysis to summarize the overall relationship between the relative costs, and benefits of a proposed project. BCR can be expressed in monetary or qualitative terms. The BCR of kidney beans production was found to be 1.32, it is likely to give positive net present value to the farmers. The average B/C ratio for kidney beans production in Chitwan, Kapilvastu, Baglung and Sindhuli Districts were found to be 1.82 in the year 2014/15 (N. B. Bhandari et al., 2015).

3.1.15 Problems of Kidney Beans Farming

Table 7: Problems of Kidney Beans Farming

Statements	Minimum	Maximum	Mean
Disease and Pests	3	5	**4.72**
Stakes unavailability	3	5	**4.52**
Irrigation	1	5	3.60
Marginal Land	1	5	3.34
Post-Harvest Loss	1	5	3.26
Seed Germination	1	5	3.02
Seed Availability	1	5	2.96
Fertilizer Availability	1	5	2.68
Labor	1	5	1.74

Note. 5 strongly agree, 4 agree, 3 un-decided, 2 disagree, 1 strongly disagree (The 5 Point Likert Scale Ranking)

The mean of 1st statement is 4.72, which means the majority of participants strongly agreed that the major problem of kidney beans farming is the occurrence of disease and pests followed by stakes unavailability (mean is 4.52). The other problems of kidney beans farming were irrigation, marginal land, post-harvest loss, poor seed germination, seed unavailability, fertilizer unavailability, and labor problems respectively.

3.1.16 Kidney Beans Production Trend

The graph shows, the production of kidney beans decreased over the past 5 years. This might be due to the severe attack of diseases, pests, and the unavailability of stakes. The average production in 2073 BS was 325 kg which slightly increased to 333.3 kg in 2074 BS. Since 2075 BS, production has decreased a lot. The average production in 2077 BS was 201.7 kg only.
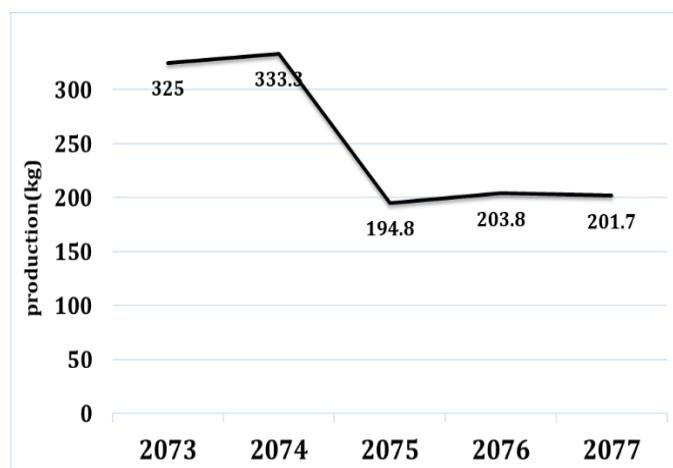

Figure 5: Kidney beans production trend

3.1.17 Activities Conducted After Harvesting Kidney Beans

All the respondents performed cleaning, drying, and sorting activities. 62.5% of respondents graded the beans after harvesting, and the remaining 37.5% of respondents performed both grading and packing.

Table 8: Practices that are done after harvesting

Activities	Frequency	Percent
Grading	30	62.5
Both grading, and packing	18	37.5

3.1.18 Production, and Sales trend of kidney beans

Since the production of beans is decreasing over years, so is the condition of sales. Production is harmed by disease and pest infestation meanwhile; the sale is decreasing as a lesser amount of beans are produced and are being used for home consumption mainly. The decreasing production and sales trend can be seen on the graph as below:
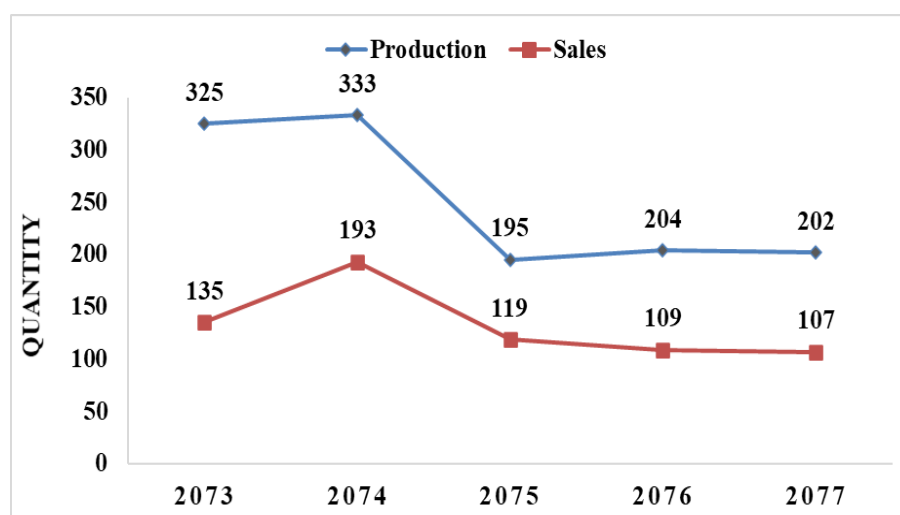

Figure 6: Production, and Sales trend of kidney beans

3.1.19 Average Price Trend for Kidney Beans

Despite, the production was decreasing over years, the price kept on increasing. In 2073 BS, the average price was Rs. 100, which increased to Rs. 135 in 2074 BS. The current average price of beans is Rs. 142 in 2077 BS. The following graph shows the increasing trend of the price of Kidney Beans over 5 years.
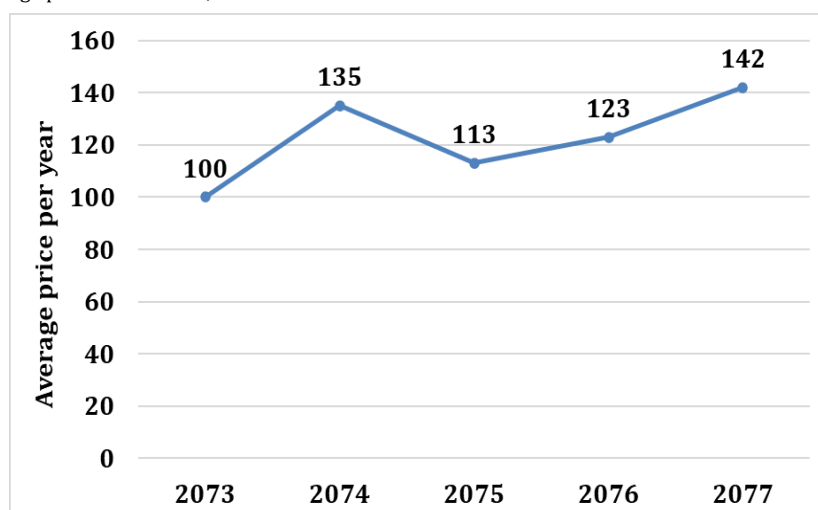

Figure 7: Average price trend of Kidney Beans

Table 10: Market price, and market margin			
Descriptions	**Farm-gate price**	**Market price**	**Market margin**
Kidney Beans	141	175	34

3.1.20 Major Price Determiner

Local collectors played a major role in the price determination of beans. District traders ranked 2ⁿᵈ followed by Wholesaler's 3ʳᵈ. Cooperatives and AKC played the least role in the price determination of beans.

Table 9: Major Player in price determination		
Major players	**Index value**	**Rank**
Local collector	**0.94**	**I**
District traders	**0.43**	**II**
Wholesaler	**0.23**	**III**
Cooperatives	**0.21**	**IV**
AKC, Darchula	**0.20**	**V**

Credit: Ease of Access

Almost all the credit institutions showed lengthy procedures to grant credits to farmers. Farmers found it difficult to take credit from AKC, Banks, Finance Companies, and even Local money Lenders.

3.1.21 Market Price, and Market Margin

The average farm-gate price was found to be Rs. 141, and the average Market Price was found to be Rs. 175. The average market margin was Rs. 34.

3.1.22 Market Price Determiner

All the market price was determined by the local demand, and traders themselves.

3.1.23 Support from the organizations

Local Government, AKC, and Non-governmental organizations had supported packaging, training related to poly-house development, and irrigation-related training. Different types of supports like improved seeds, fertilizers, collaterals, funds, loans, and marketing assurance could harness the potential of farmers to grow, and produce more. Suitable supports including improved seeds, disease-pest management techniques, and durable stakes are to be prioritized first here.

3.2 Traders' Socio-Economic Characteristic

3.2.1 Gender Participation of Traders

Participation of men (73.33%) is more than women (26.67%) in traders' surveys (figure 4). This finding may be taken as evidence of the priority of male members for income-earning activities and women have been taking the responsibility of farming besides household chores.
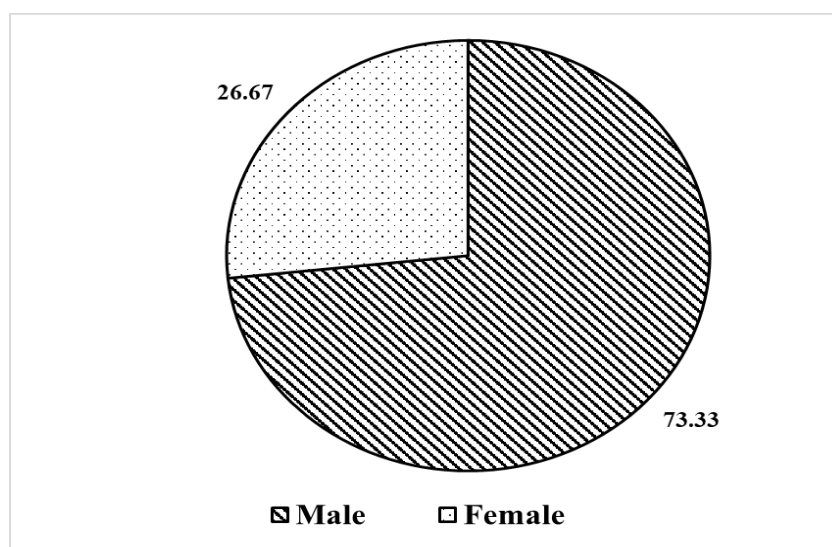

Figure 8: Gender Participation of Traders

3.2.2 Collection of Beans

The majority of the traders collected the beans from local farmers. Traders were also found to be involved in the self-production of beans. Most of the traders also collected beans from other local traders, and community groups as well.

3.2.3 Trade Coordination

86.67% of traders solely ran the trading business and 13.33 % coordinated with partners, and cooperatives respectively.

3.2.4 Quantity of Beans Collected in The Past 5 Years

About 21,250 kg of beans were collected in 2077 BS. The minimum amount collected was 150 kg and the maximum collected was 5,500 kg in the same year.

Table 11: Beans Collection in Last Five Years					
	Quantity of beans collected				
	2073 (kg)	2074 (kg)	2075 (kg)	2076 (kg)	2077 (kg)
Minimum	500	510	100	100	150
Maximum	6,000	5,500	5,000	5,000	5,500
Sum	6,500	6,010	10,250	14,950	21,250
Mean	3,250.00	3,005.00	1,281.25	1,245.83	1,416.67

3.2.5 Buying and Selling Price of Beans

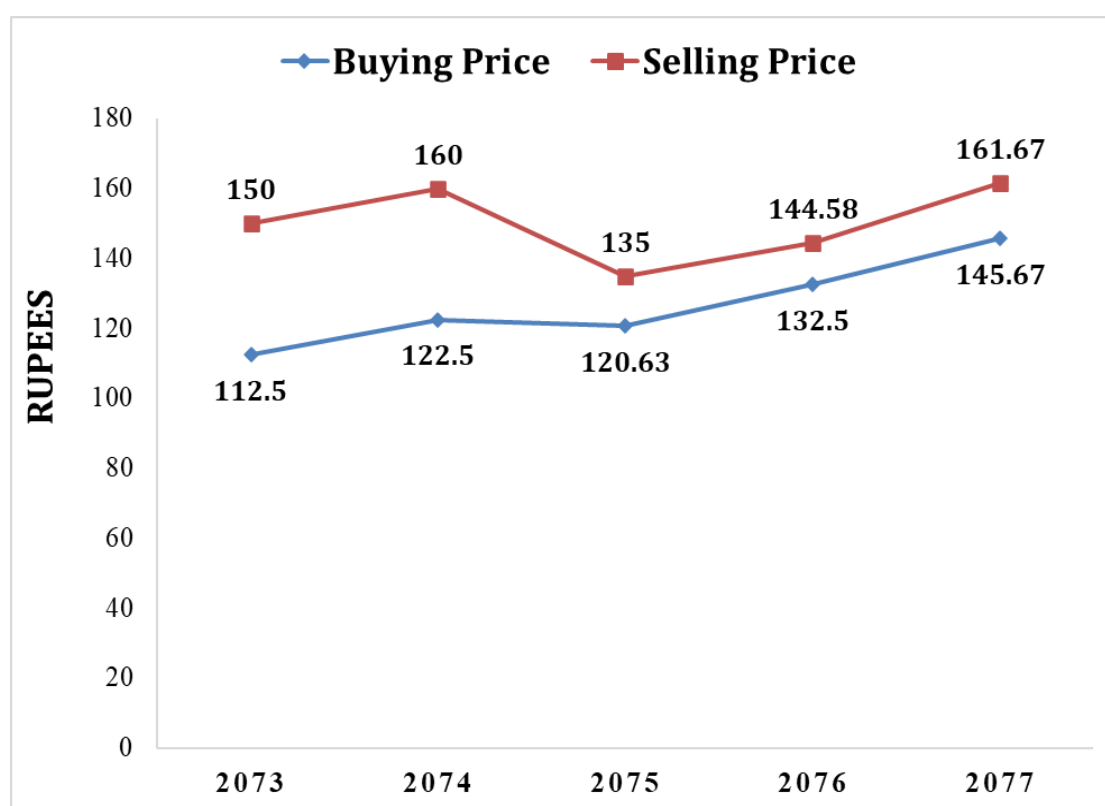The average buying price of beans was Rs. 112.50 in 2073 BS and Rs. 161.67 in 2077 BS respectively.

Figure 9: Buying and Selling Price of Beans

3.2.6 Mode of transaction closure

67% of traders closed their transactions via. Cash, 33% of traders traded beans with cash as well as rice as a mode of payment. 1 Kg of beans was exchanged with 2 to 3 Kg of Rice. **For the Ghiusimi variety, 3 Kg rice was exchanged, and for the red variety, 1.5-2 Kg rice was exchanged.**

3.2.7 Transportation Cost

The average cost of labor was Rs. 1000, that of the mule was Rs. 10,238.46 (5-8 Rs. Per kg of load), and the vehicle cost was Rs. 16,000.

Table 12: Cost of Transportation			
	Labor cost	Mule Cost	Vehicle Cost
Minimum	0	1,500	1,800
Maximum	15,000	35,000	30,000
Mean	1,000.00	10,238.46	16,000.00

3.2.8 Total Investment and Net Profit Gained

The average investment in Kidney Beans Trading Business was found to be Rs. 2,22,000, and the average net profit per season was Rs. 24,700.

Table 13: Money Invested, and Net profit gained per season		
	Investment	Net profit gained
Minimum	20,000	2,000
Maximum	10,00,000	55,000
Mean	2,22,000.00	24,700.00

3.3 The Average Buying and Selling rate of Different Varieties of Beans

The average buying rate of Ghiusimi was Rs. 147. Rs 120.67 and Rs. 126.67 for Rato or Bhatte Beans and Variegated Beans respectively.

The average selling rate of Ghiusimi was Rs. 165.33, and Rato or Bhatte variety was Rs. 134.67 and variegated beans were Rs. 143.33.
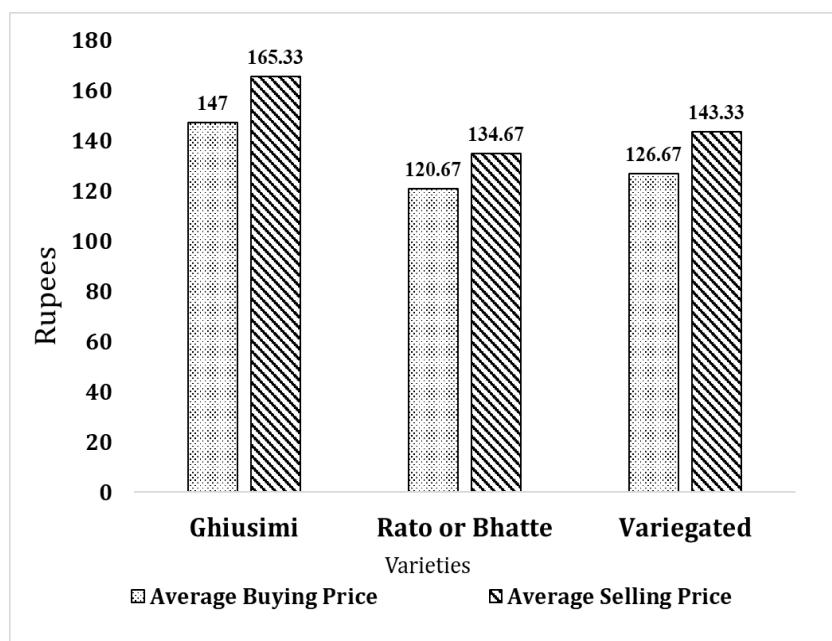
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Figure 10: The Average Buying and Selling rate of Different Varieties of Beans

3.4 Price Spread of Different Varieties of Beans

The following table shows the price spread of different varieties of beans

grown in the Api-region from farm gate price to Distance market price.

Table 14: Price Spread of Different Varieties of Beans			
	Rato/Bhatte (Rs.)	**Variegated Beans (Rs.)**	**Ghiusimi (Rs.)**
Farmgate price	80	100	130
Local collectors Price	85	110	140
Local market price	100	130	160
Distant Market Price	130-140	145-155	180-200+

3.5 Market Competition

No competition was found for the beans grown in the research area. The traders claimed that no beans of other places had to compete with Beans

of the Api-region, and that's why the demand for Beans was found more there.

3.6 Activities to increase the competition of Beans in the Market

Table 15: Activities to increase the competition of Beans in the Market			
Statements	**Minimum**	**Maximum**	**Mean**
Advertisement	3	5	**4.40**
Changing Variety	1	5	4.27
Quality production	1	5	4.07
Packaging	1	5	3.67
Labeling	1	5	3.20
Sorting Grading	1	5	3.00
Certifying	1	5	2.60

Note. 5 strongly agree, 4 agree, 3 neutral, 2 disagree, 1 strongly disagree (The 5 Point Likert Scale Ranking)

The mean of the 1st statement is 4.40 thus, the majority of the respondents strongly agreed that the advertisement would increase the competition of beans in the market. The other activities like Changing of variety, quality production, packaging, labeling, sorting, grading, and certifying would also increase the competition in the market respectively.

3.7 SWOT Analysis

SWOT Analysis is a powerful analytical tool used in developing full awareness of all the controllable, and non-controllable factors that help in the Farm-Business decision-making process.

3.8 Strengths

Api-Himal RM is greatly suited for the production of Kidney Beans as the

agro-climate is highly favorable. The research area is completely organic as, the farmers have no idea about chemicals, and pesticides, all the goods produced here are 100% organic.The farmers utilize only local resources which minimize the cost of production.The interest of farmers is growing towards Kidney Beans as its demand is high, and fetch a higher price.Since farmers use FYM only, it maintains soil health and protects the natural health of microorganisms of the soil. Healthy soil also produces healthy crops.Organic beans fetch a higher price in the market and also provide employment opportunities to the women of the village.

3.9 Weakness

Most of the farmers lack proper cultivation methods of beans.Almost all the farmers lack knowledge about disease pest management so, they suffer from heavy loss due to diseases.The unavailability of stakes due to the

over-exploitation of Nigalo is a major weakness here.There is no government subsidy to compensate for their loss due to disease, and pests.Skilled manpower or Agriculture professionals are very far from the reach of the farmers.Inadequate supply, and access to quality inputs, nutrients, organic fertilizers, bio- insecticides, and bio-pesticides.Poor local market opportunities, and infrastructures.The problem of irrigation is also one of the major weaknesses.

3.10 Opportunities

There are large numbers of small farmers in the area. So, the farmers themselves could fulfill the labor demand that shows the employment opportunity.There is increasing local awareness of the benefits of beans production.If their products are exposed to distant markets, they would fetch a very higher price.The beans' demand is high and fetches a higher

price than other produce.If Bio-insecticides and IPM training were given to the farmers, they would harness the production to the optimum.Stakes that could be reused again, and again, if they were provided to farmers, the production of beans would flourish, and exploitation of Nigalo would be stopped too.Governmental support in policy programs for training, and subsidy.

3.11 Threats

Disease pest infestation is decreasing the production regularly, and the day might come that farmers may not grow beans any longer if the disease infestation continues.The increasing migration of rural workforce towards the cities, and outside the country for better employment opportunities.Farmers are shifting towards Yarshagumba collection, and animal husbandry rather than beans production.
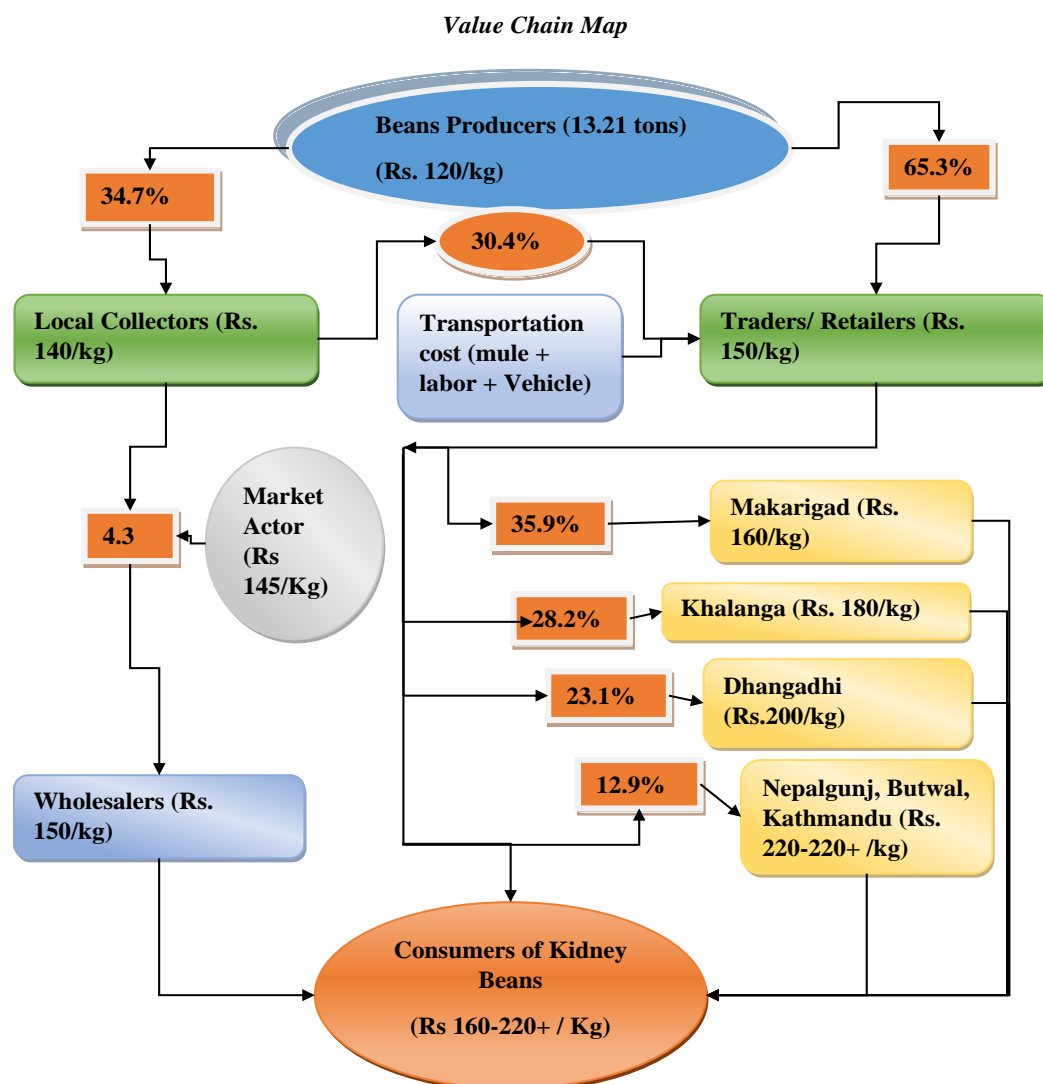
Value Chain Map

Figure 11: Value Chain Map of Kidney Beans

4. CONCLUSION AND POLICY IMPLICATIONS

Kidney bean (*Phaseolus vulgaris* L.) also known as *Simi, Rajma, French bean*, *Phaseolus* bean, the indeterminate long-duration type is grown during summer in mid/high hills and the determinate early maturity type is grown during winter months (post rainy) in Terai. It is an important cash-generating legume in Darchula where mixtures of landraces with different sizes and varieties are harvested and sold in the market. The production area under kidney bean is in rising trends due to ease in marketing and higher profit. A total area of 255 ropani was under Kidney Beans cultivation in Api-Himal RM. The land needed 1020 kg of seeds, and productivity was 1.29 mt. /ha. It was found that 72.92% of the members were engaged in agriculture. The study showed that 1 kg of seed cost 120 Rs. The average cost incurred in production was Rs. 21,380, and the average yield was 202 kg. The average farm-gate price was found to be Rs 141 per kg, and the market price was Rs 160 per kg. The output worth was found to be more than the input cost. The mean b/c ratio was 1.32 which means, the production of kidney beans is likely to succeed in a long-term

business. The productivity and area under kidney beans cultivation is in increasing trend in recent years. Due to the occurrence of various problems in the production process, and trading system, returns were found quite low than expected. Lack of sufficient staking, poor irrigation availability, and incidence of pests, and diseases were found to be major production problems that are lowering the net return whereas, price fluctuation, transportation problems, and low-quality produce were found major as trading problems. The major value addition activity was found to be transportation cost.

From the study, it was concluded that Kidney beans cultivation is a highly profitable occupation in the context of the Api-Himal region of Darchula district and can be commercialized on large scale but proper policies, appropriate production techniques, necessary productions inputs, and a well-systemized trading process should be guaranteed.

The research has indicated that kidney beans are a highly valuable and highly consumer demanded commodity in Darchula district. More than 50

percent of beans flow through the channel of farmers – wholesalers (Makarigad) – retailers and customers. Even though, several genuine obstacles and significant possibilities were recognized among value chain participants in the districts. Such limits can be controlled by the enhancement of production technology, management, expanding linkage increasing networking between service recipients and suppliers. There are also certain chances for the development of the marketing system which may be harnessed by the marketing group in the market planning process. For the continuous success of the kidney beans business in Darchula district of Nepal, several governmental initiatives are necessary. These are:

1. There must be a linkage between agro-vets and recognized beans seed providers and distributors for quality input distribution to beans producers;

2. There is large market of organic produce in the survey area, thus the government must provide subsidies to beans farmers to adopt organic farming.

3. Because of Poor understanding, input providers and beans producers are unable to reinvest in this enterprise, so government should offer adequate information relating to the loan application procedure, payback process, their amounts and guidelines for proper utilization.

4. Government should offer market infrastructure and price information to quality supplies availability, seed demand, pricing of crops, limit misconduct and wastage;

5. Most of the bean producers in Darchula area are utilizing jute sacks for delivering products to the market. Thus, the government should offer instruction to vegetable producers concerning packaging materials and bins etc.

6. Producers were not implementing appropriate sorting, grading, cleaning and storing standards. Therefore, the government should offer instructions to farmers concerning this to improve quality of beans and increase net revenue from the produce.

7. There is a need to improve farm owners' contribution to consumer prices and enhance market performance by eliminating the market actors (middlemen) in the value chain.

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